

SUGAR SANDS

are important part of
maple sugar research

The production of maple syrup and sugar from the sap of the maple tree is a process which is solely American, since both products were used by Indians before the arrival of the white man. Although maple syrup production is recognized as one of our oldest industries, relatively little scientific work has been done on this product since the development of atmospheric evaporation equipment around the turn of the century.

Ohio is fourth

Today, however, Ohio maple syrup producers, in cooperation with the Ohio Agricultural Experiment Station, through a grant from the U.S.D.A. Eastern Utilization Research and Development Division, are playing an important part in this research. This is rightly so, since Ohio consistently ranks fourth in the country in maple syrup production. Despite this high position, it has been estimated that less than two percent of the tappable trees in this state are being utilized.

Ohio has about 1,000 maple syrup producers, with Geauga County producing about 40 percent of the total production. This county has become synonymous with high quality maple syrup and people from many distant states attend the yearly maple syrup festival which is held in Chardon in early April.

Ohio's part in maple syrup research is as important as it is interesting. There is a considerable amount of work at the present time concerned with methods



Picturesque sugar house facilities belong to Don Riley near Burton. He is one of few producers in state who does not have difficulty with sugar sand.



Fred Quinn, left, OAES Forestry department, visits operation of Howard Call, producer near Stow as Call makes viscosity test.

or collecting sap, modernization of processing procedures, and improving quality. Scientists at the Experiment Station, however, are concerned with an age old phenomenon which has occurred probably since the Indians made their first batch of maple syrup. When the clear, sparkling sap is transferred to the evaporator pan and concentrated to maple syrup a gritty deposit is formed in most cases. This deposit is called sugar sand by the maple syrup producers. In most instances it looks like sand since it is a white or light brown gritty material, while sometimes it resembles tar, both in color and in physical characteristics. Its presence in maple syrup necessitates the filtering of the syrup before it is put on the market.

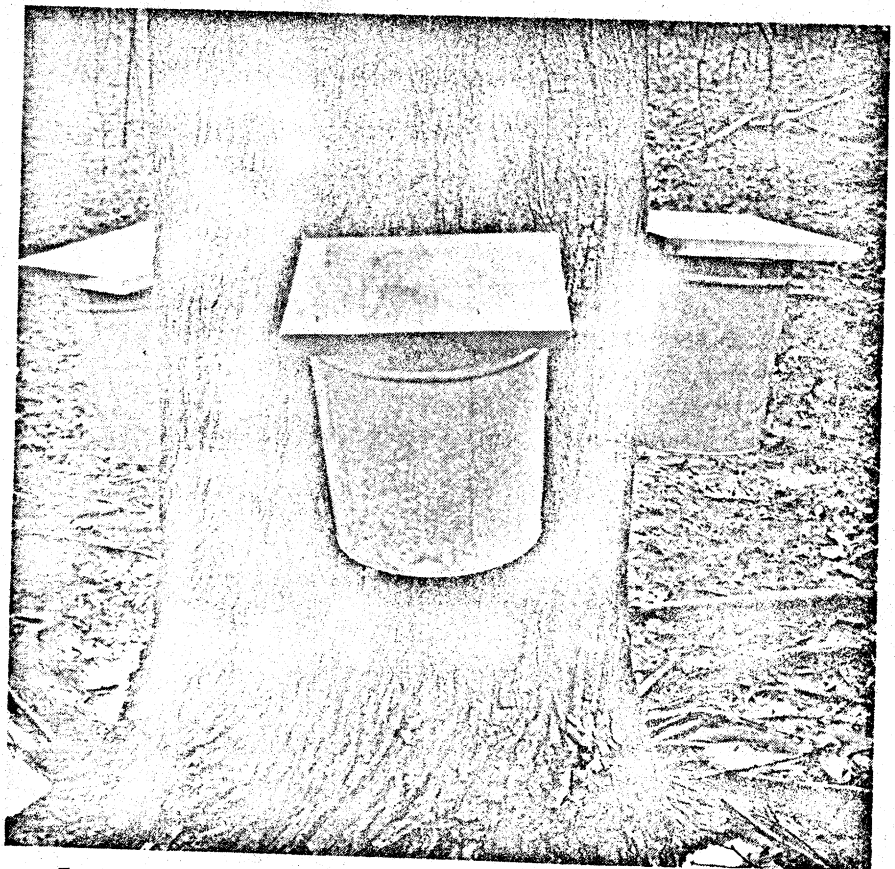
Many cooperators

Forty-eight syrup producers in 16 Ohio counties are cooperating in this study by providing samples of sugar sand and syrup for analysis, and keeping detailed records of their production. These producers were chosen by their ecological location, not for their size or efficiency of operation. The sugar sand study basically consists of two phases: 1) the effect of the environmental factors on the deposition of sugar sand, which is being handled by the Department of Forestry, and 2) the chemical and physical composition of sugar sand, with the Department of Horticulture doing the analysis.

Under the forestry phase, the relationship of the amount of sugar sand produced during syrup production to the location of the sugar bush is being evaluated with regard to exposure (North, South, East, or West); elevation (low or



Sugar bush on farm of Howard Call has been producing for three generations of Call family.



Typical procedure for tapping trees is demonstrated, using covers for protection of sap.

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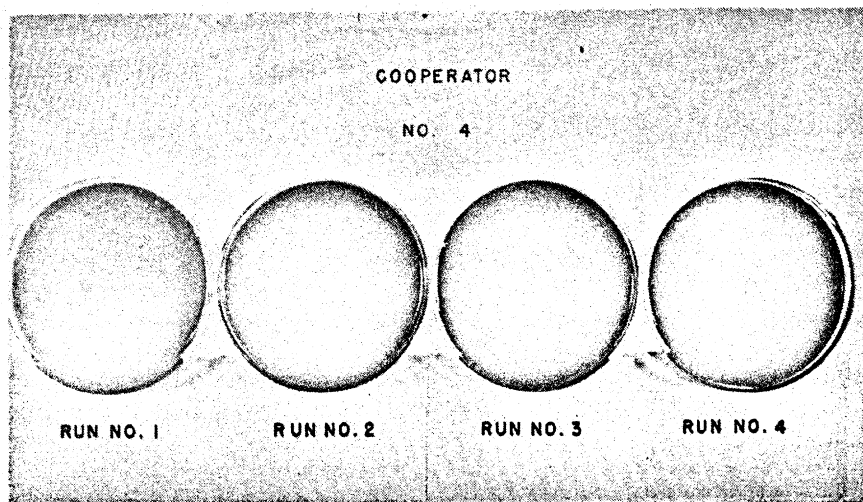
high on the hillside); and soil texture (light or heavy).

It was found that the results based upon the average figures for the sugar sand produced in 1960 show no significant differences between the North, East or West aspects in the percentages of sugar sand produced. The Southern aspect was significantly lower than the Northern but not from the Eastern or Western.

The results for the production of sugar sand with respect to aspect in the 1961 season followed the same pattern, the production of sugar sand being greatest on the Northern aspect and lowest on the Southern.

There were no significant differences with the relationship of the relative soil texture (light or heavy), to the production of sugar sand in either the 1960 or 1961 seasons.

With regard to elevation there was statistically a significantly higher production of sugar sand



Color of sugar sand ranges from light to dark as season progresses. Tests to date indicate color is closely related to calcium content.

on the relatively higher locations as opposed to the lower ones in the 1961 season and near significance in the 1960 season.

The color variation in sugar sand is quite unusual since it is different not only between producers, but between different runs from the same producer, as shown in the picture. The color of the sugar sand is related to the calcium content of the sugar sand. As the season progresses there is also an increase in the deposition

of sugar sand for a given volume of syrup.

There is apparently a direct relationship between the amount of sugar sand formed and the calcium and malic acid content. Thus, as the calcium and malic acid content increase, the amount of sugar sand deposited for a given volume of syrup will also increase. This further supports earlier findings which indicated that the main constituent of sugar sand is calcium malate.